CLAIMS

1. A position detector comprising:

a first member comprising an excitation winding, and at least one sensor winding;

an excitation circuit for applying a driving signal to the excitation winding; and

a second member moveable relative to the first member and comprising means for interacting with said windings such that, in response to a driving signal being applied to said excitation winding by said excitation circuit, there is generated in the or each sensor winding an output signal, said interacting means and said windings being arranged so that said output signal varies as a function of the relative position of the first and second members,

wherein the excitation circuit is arranged to apply a sequence of voltage pulses across said excitation winding, with the duration of said pulses being less than a decay time constant of a current loop formed by said excitation circuit and said excitation winding.

2. A position detector comprising:

a first member comprising an excitation winding;

an excitation circuit for applying a driving signal to the excitation winding; and

a second member moveable relative to the first member and comprising a sensor winding electromagnetically coupled to said excitation winding, said electromagnetic coupling varying with the relative position of said first and second members such that, in response to a driving signal being applied to said excitation winding by said excitation circuit, there is generated in the sensor winding an output signal which varies as a function of said relative position,

wherein the excitation driver is arranged to apply a sequence of voltage pulses across said excitation winding, with the duration of said pulses being less than a decay time constant of a current loop formed by said excitation driver and said excitation winding.

3. A position detector according to either claim 1 or claim 2, wherein the excitation circuit is fixed relative to the excitation winding.

4. A position detector according to any preceding claim, wherein the excitation circuit is arranged to generate an excitation sequence comprising alternating positive and negative voltage pulses.

5. A position detector according to any of claims 1 to 3, wherein the excitation circuit is arranged to generate an excitation sequence comprising alternating pairs of positive voltage pulses and negative voltage pulses.

6. A position detector according to any preceding claim, wherein the excitation circuit is arranged to generate an excitation sequence in which the voltage pulses are separated by periods during which a reduced voltage is applied.

7. A position detector according to claim 6, wherein the excitation circuit is arranged to generate an excitation sequence in which the voltage pulses are separated by periods during which no voltage is applied.

8. A position detector according to either claim 6 or claim 7, wherein the excitation circuit is arranged to generate an excitation sequence in which the duration of each voltage pulse is less than the duration of the

periods between the voltage pulses.

9. A position detector according to any preceding claim, wherein the excitation driver is arranged to generate an excitation sequence comprising a burst of voltage pulses comprising a first pulse, a plurality of intermediate pulses, and an end pulse, wherein the duration of each of the intermediate pulses is substantially the same and the duration of the start pulse is shorter than the duration of the intermediate pulses.

10. A position detector according to claim 9, wherein the excitation circuit is arranged such that the duration of the end pulse is shorter than the duration of the intermediate pulses.

11. A position detector according to any of claims 1 to 8, wherein the excitation circuit is arranged to generate an excitation sequence comprising a burst of voltage pulses comprising a first pulse, a plurality of intermediate pulses, and an end pulse, wherein the duration of each of the intermediate pulses is substantially the same and the duration of the end pulse is shorter than the duration of the intermediate pulses.

12. A position detector according to any preceding claim, wherein the excitation circuit is arranged to repeat the excitation sequence on a periodic basis.

13. A position detector according to any preceding claim, wherein the excitation circuit comprises:

an excitation driver operable to supply the driving signal to the excitation winding; and

control means for generating a control signal

defining an excitation sequence, the control means being arranged to supply the control signal to the excitation driver so that the excitation driver is operable to supply the excitation sequence as the driving signal.

14. A position detector according to claim 13, wherein the control means comprises a processor and storage means storing instructions for causing the processor to generate the control signal.

15. A position detector according to either claim 13 or claim 14, wherein the excitation circuit comprises means for modulating the time decay constant.

16. A position detector according to claim 15, wherein the modulating means is arranged to vary a resistive loss in the current loop.

17. A position detector according to claim 16, wherein the excitation circuit is arranged such that the resistive loss in the excitation circuit is increased by the modulating means after the final excitation pulse of an excitation sequence.

18. A position detector according to any of claims 13 to 17, wherein the control means further comprises means for receiving set-up information from a host device, the set-up information defining parameters for use in the generation of the excitation sequence.

19. A position detector according to claim 18, wherein the excitation circuit is arranged to vary the duration of the voltage pulses in the excitation sequence in dependence on the information received via the receiving means.

20. A position detector according to claim 18, wherein the excitation circuit is arranged to vary the pulse repetition rate of the voltage pulses in the excitation sequence in dependence upon the information received via the receiving means.

21. A position detector according to claim 18, wherein the excitation circuit is arranged to repeat the excitation sequence on a periodic basis, the rate at which the excitation sequences are repeated being dependent upon the information received via the receiving means.

22. A position detector according to any of claims 13 to 21, wherein the control means further comprises means for receiving a signal indicative of the power supply voltage for the excitation driver, and wherein the control means is operable to vary the control signal such that the duration of the voltage pulses in the excitation sequence is varied in dependence on the indicated power supply voltage.

23. A position detector according to any of claims 13 to 21, further comprising means for sensing whether or not the first and second members are within a sensing range of each other,

wherein said control means is operable to cause the excitation driver to generate an excitation sequence having excitation pulses with a first duration when the sensing means senses that the first and second members are within the sensing range, and with a second duration when the sensing means senses that the first and second members are not within the sensing range, the first duration being longer than the second duration.

24. A position detector according to any of claims 13 to 23, wherein the excitation driver comprises switching elements implemented in MOSFET technology.

25. A position detector according to claim 24, wherein the excitation driver comprises at least one n-channel MOSFET switch and at least one p-channel MOSFET switch, the or each n-channel MOSFET switch having a lower on-resistance than the or each p-channel MOSFET switch.

26. A position detector according to either claim 24 or claim 25, wherein the excitation circuit is arranged such that during the excitation sequence the or each n-channel MOSFET switch is switched on for a longer time than the or each p-channel MOSFET switch.

27. A position detector according to any preceding claim, wherein the apparatus is arranged such that the time decay constant of the current loop incorporating the excitation winding is longer than twice the duration of each of the voltage pulses.

28. A position detector according to any preceding claim, wherein the apparatus is arranged such that the time decay constant of a current loop incorporating the excitation winding is longer than five times the duration of each of the voltage pulses.

29. A position detector comprising:

a first member comprising an excitation winding and at least one sensor winding;

an excitation circuit for applying a driving signal to the excitation winding; and

a second member moveable relative to the first member and comprising means for interacting with said

winding such that, in response to a driving signal being applied to said excitation winding by said excitation circuit, there is generated in the sensor winding an output signal, said interacting means and said windings being arranged so that said output signal varies as a function of the relative position of the first and second members,

wherein the excitation circuit is operable to apply a sequence of voltage pulses across said excitation winding, with the duration of the first voltage pulse in the excitation sequence being less than the duration of subsequent voltage pulses in the excitation sequence.

30. A position detector comprising:

a first member comprising an excitation winding;

an excitation circuit for applying a driving signal to the excitation winding; and

a second member moveable relative to the first member and comprising a sensor winding electromagnetically coupled to said excitation winding, said electromagnetic coupling varying with the relative position of said first and second members such that, in response to a driving signal being applied to said excitation winding by said excitation circuit, there is generated in the sensor winding an output signal which varies as a function of said relative position,

wherein the excitation circuit is operable to apply a sequence of voltage pulses across said excitation winding, with the duration of the first voltage pulse in the excitation sequence being less than the duration of subsequent voltage pulses in the excitation sequence.

31. A position detector comprising:

a first member comprising an excitation winding and at least one sensor winding;

an excitation circuit for applying a driving signal to the excitation winding; and

a second member moveable relative to the first member and comprising means for interacting with said winding such that, in response to a driving signal being applied to said excitation winding by said excitation circuit, there is generated in the sensor winding an output signal, said interacting means and said windings being arranged so that said output signal varies as a function of the relative position of the first and second members,

wherein the excitation circuit is operable to apply a sequence of voltage pulses across said excitation winding, with the duration of the final voltage pulse being less than the duration of previous voltage pulses.

32. A position detector comprising:

a first member comprising an excitation winding;

an excitation circuit for applying a driving signal to the excitation winding; and

a second member moveable relative to the first member and comprising a sensor winding electromagnetically coupled to said excitation winding, said electromagnetic coupling varying with the relative position of said first and second members such that, in response to a driving signal being applied to said excitation winding by said excitation circuit, there is generated in the sensor winding an output signal which varies as a function of said relative position,

wherein the excitation circuit is operable to apply a sequence of voltage pulses across said excitation winding, with the duration of the final voltage pulse being less than the duration of previous voltage pulses.

33. A position detector comprising:

a first member comprising an excitation winding and at least one sensor winding;

an excitation circuit for applying a driving signal to the excitation winding; and

a second member movable relative to the first member and comprising means for interacting with said winding such that, in response to a driving signal being applied to said excitation winding by said excitation circuit, there is generated in the sensor winding an output signal, said interacting means and said windings being arranged so that said output signal varies as a function of the relative position of the first and second members,

wherein the excitation circuit is arranged to apply a sequence of voltage pulses across said excitation winding, and such that between excitation pulses a current loop is formed incorporating the excitation winding and wherein the position detector further comprises modulating means for modulating a decay time constant of the current loop.

34. A position detector comprising:

a first member comprising an excitation winding;

an excitation circuit for applying a driving signal to the excitation winding; and

a second member moveable relative to the first member and comprising a sensor winding electromagnetically coupled to said excitation winding, said electromagnetic coupling varying with the relative position of said first and second members such that, in response to a driving signal being applied to said excitation winding by said excitation circuit, there is generated in the sensor winding an output signal which varies as a function of said relative position,

wherein the excitation circuit is arranged to apply a sequence of voltage pulses across said excitation

winding, and such that between excitation pulses a current loop is formed incorporating the excitation winding and wherein the position detector further comprises modulating means for modulating a decay time constant of the current loop.

35. A portable data input/output device comprising a position detector according to any preceding claim.

36. A device according to claim 35, wherein said device is a personal digital assistant.

37. A device according to claim 35, wherein said device is a mobile telephone.

38. A device according to any of claims 35 to 37, wherein said device is battery-powered.

39. A drive circuit for energising a predetermined excitation winding of a position sensor, wherein the drive circuit is operable to apply a sequence of voltage pulses across said winding, with the duration of said pulses being less than a decay time constant of a current loop formed by said drive circuit and said excitation winding.

40. A drive circuit for generating and applying pulses of electromotive force to a predetermined excitation winding of a position sensor, wherein the drive circuit is operable to apply a electromotive force having a first amplitude during said pulses and is operable to apply an electromotive force having a second amplitude lower than said first amplitude in periods between said pulses and wherein the drive circuit is operable to generate said pulses so that their duration is less than the duration

of said periods between said pulses.

41. A drive circuit for generating and applying voltage pulses to an excitation winding of a position sensor, wherein the drive circuit is operable to apply pulses having a first voltage, a second lower voltage and a third voltage intermediate to said first and second voltages.